BELOTSERKOVSKIY, D.Yu.

Calculation of standard time by mean moments of transmission of radio signals. Trudy inst. Kom. stand., mer i izm. prib. no.58:65-82 '62. (MIRA 15:11)
(Time--Systems and standards)
(Time signals)

BELOTSERKOVSKIY, D.Yu.

Investigation of the performance of four quartz clocks. Trudy inst. Kom. stand., mer i izm. prib. no.58:83-91 '62. (MIRA 15:11)

(Time clocks)

BELOTSERKOVSKIY, D.Yu.

Simultaneous use of integral comparisons of a quartz clock and of comparisons of its frequencies with the frequency of a molecular generator for the determination of most probable corrections for the quartz clock. Trudy inst.Kom.stand., mer i izm.prib. no.59:99-100 '62. (MIRA 16:1)
(Frequency measurements) (Clocks and watches)

ACCESSION NR: AT4026435 S/2589/62/000/059/0099/0100

AUTHOR: Belotserkovskiy, D. Yu.

TITLE: Joint use of integral comparisons of crystal clocks and comparisons of their frequencies with the frequency of a molecular generator in order to determine the most probable changes in the crystal clock corrections

SOURCE: USSR. Komitet standartov, mer i izmeritel'ny*kh priborov. Trudy* institutov Komiteta, no. 59 (119), 1962. Issledovaniya v oblasti izmereniya chastoty* (Investigations in the field of frequency measurement), 99-100

TOPIC TAGS: frequency measurement, time, standard time, crystal clock, molecular generator, molecular generator frequency, crystal generator

ABSTRACT: It is generally held that the frequency of a molecular generator does not change in the course of time and that comparisons of the frequency of a crystal generator with that of a molecular generator provide a basis for the determination of the magnitude of the change in the frequency of the crystal generator during the period of time between comparisons. The curve shown in the Enclosure represents the variation in a crystal clock generator frequency with respect to the frequency of a molecular generator during several 24-hour periods. From comparisons with the molecular generator, the value of

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the ordinate at the end of the 24-hour period is obtained. Then the change in the correction of the crystal clocks for a 24-hour period, on the basis of the data supplied by the comparison with the molecular generator, will be $\Delta U = \frac{\Delta g}{2}$. It is assumed that the change in the crystal clock generator frequency for these 24-hour periods can be expressed by the function $\varphi(t)$. If this function were known, the change in the clock correction for a 24-hour period might be determined by integration

$$\Delta U = \int_0^T \varphi\ (t)dt.$$

The difference $\frac{1}{2}\ \Delta g - \int_0^T \varphi\ (t)dt = v$ represents the error in the determination of the clock correction change, obtained from instantaneous comparisons with the molecular generator with respect to its actual change. It is assumed that several crystal clock generators are directly compared with the molecular generator and are also compared with one another by means of a continuous counting of the beats of their fundamental frequencies by the so-called integral method. The results of the instantaneous comparisons of crystal generators 1, 2, 3,...N with the crystal generator for the same 24-hour periods are designated as Δg_1, Δg_2, Δg_3,...g_N. A system of equations is then written, summed

and, by taking the average, the author obtains

$$\frac{1}{2}\Delta g_1 - v_1 = \frac{K}{N}\sum_1^N \Delta n_{1,i} + \frac{1}{2N}\sum_1^N \Delta g_i - \frac{1}{N}\sum_1^N v_i.$$

If the values v_i for different crystal generators during the same 24-hour period can be considered independent, and if the number of generators is large, the last term will differ little from zero. Thus, on the basis of the last formula, the actual value of the correction change for clock number 1 can be determined.

$$\Delta U_1 = \frac{1}{2}\Delta g_1 - v_1 = \frac{K}{N}\sum_1^N \Delta n_{1,i} + \frac{1}{2N}\sum_1^N \Delta g_i.$$

The correction changes of all the remaining clocks can be derived at will. Orig. art. has: 1 figure and 10 formulas.

ASSOCIATION: Komitet standartov, mer i izmeritel'ny*kh priborov (Committee for Standards, Measures and Measuring Instruments)

ACCESSION NR: AT4026435

SUBMITTED: 00Jun60 DATE ACQ: 24Apr64 ENCL: 01

SUB CODE: AS NO REF SOV: 000 OTHER: 000

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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204400019-6

ACCESSION NR: AT4045940 S/0000/63/000/000/0022/0026

AUTHOR: Belotserkovskiy, D. Yu.

TITLE: Short-period nonuniformity of the earth's rotation

SOURCE: AN SSSR. Astronomicheskiy sovet. Komissiya po izucheniyu vrashcheniya Zemli. Plenum. 1st, Kiev, 1962. Vrashcheniye Zemli (Rotation of the Earth); materialy* plenuma. Kiev, Izd-vo AN USSR, 1963, 22-26

TOPIC TAGS: astronomy, astrometry, earth rotation, clock correction, quartz clock, molecular clock, time service

ABSTRACT: A study was made of short-period changes in the earth's rate of rotation, based on data of adjusted astronomical observations from 17 time services for 7 years (1955-1961). Prior to adjustment the astronomical observations were grouped by half-months and the mean values of clock corrections (analytical molecular and quartz clocks) were determined. For simplification of further computations the values were reduced to standard epochs, separated by intervals of 15.2 days. Curves and tables presented in the paper definitely show the presence of a short-period nonuniformity of the earth's rotation with a period extremely close to three months and of variable amplitude, maximal in the

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ACCESSION NR: AT4045940

spring-summer period and minimal in the autumn-winter period. The maximum amplitude of the deviations of corrections (0.004 sec) is close to the amplitude of the semi-annual wave of seasonal nonuniformity. The epochs of the maxima and minima in different years agree rather well and only in 1958 and in the first half of 1956 were they displaced significantly relative to the mean values. It is impossible to expect total coincidence of the phases of the short-period component of different years because it is apparently caused, like the annual and semi-annual components, by meteorological phenomena which are repeated, but not at the same time. The adjustment of astronomical observations for these years was done using analytical molecular clocks and it therefore can be assumed that the results are not distorted by periodic changes in clock rate caused by local factors. Orig. art. has: 1 figure, 4 tables and 1 formula.

ASSOCIATION: AN SSSR, Komissiya po izucheniyu vrashcheniya Zemli, Astronomicheskiy sovet (Commission on Study of the Earth's Rotation, Council on Astronomy, AN SSSR)

SUBMITTED: 13Dec63 ENCL: 00 SUB CODE: AA, ES

NO REF SOV: 000 OTHER: 000

Card 2/2

BELOTSERKOVSKIY, Grigoriy Bentsionovich; KALANTAKOV, M.N., inzh., retsenzent; PASTOVSKIY, I.N., kand. tekhn. nauk, retsenzent; OKUN', Ye.L., inzh., nauchn. red.; KVOCHKINA, G.P., red.

[Oscillatory circuits and filters] Kolebatel'nye kontury i fil'try. Leningrad, Sudostroenie, 1965. 135 p.
(MIRA 18:8)

BELOTSERKOVSKIY, G. B.

283 Osnovy Radiolokatsii. (Ucheb. Posobie Dlya Priborostroit. Tekhnikumov). M. Oborongiz, 1954. 304s. S Ill 23 SM. 6 r. (00 K. V Per.--(54-6 1?) P. 621.396.9:526.9?

SO: Knizhnaya, Letopis', Vol. 1, 1955

BELOTSERKOVSKIY, Grigoriy Bentsionovich; RABKIN, N.I., inzhener, retsenzent; IVANOV-TSYGANOV, A.I., kandidat tekhnicheskikh nauk, redaktor; PETROVA, I.A., izdatel'skiy redaktor; SHCHERBAKOV, P.V., tekhnicheskiy redaktor

[Antennas] Antenny. Moskva, Gos. izd-vo obor. promyshl., 1956. 495 p. (Radio--Antennas) (MLRA 10:1)

PHASE I BOOK EXPLOITATION SOV/3817

Belotserkovskiy, Grigoriy Bentsionovich

Millimetrovyye volny (Millimeter Waves) Moscow, Gosenergoizdat, 1959. 79 p. (Series: Massovaya radiobiblioteka, vyp. 352) 46,000 copies printed.

Ed.: Yu. A. Sagaydachnyy; Tech. Ed.: G. Ye. Larionov; Editorial Board: A. I. Berg, F. I. Burdeynyy, V. A. Burlyand, V. I. Vaneyev, Ye. N. Genishta, I. S. Dzhigit, A. M. Kanayeva, E. T. Krenkel', A. A. Kulikovskiy, A. D. Smirnov, F. I. Tarasov, and V. I. Shamshur.

PURPOSE: This booklet is intended for radio amateurs possessing an elementary knowledge of radar and centimeter waves.

COVERAGE: The booklet describes the use of millimeter waves and the pecularities of their radiation, propagation, reception, and amplification. This field of radio engineering is relatively new and holds much promise for the future. No personalities are mentioned. There are no references.

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Millimeter Waves SOV/3817

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AVAILABLE: Library of Congress (QC665.B37)

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ZIZEMSKIY, Yefim Il'ich; BELOTSERKOVSKIY, G.B., nauchnyy red.; SHAURAK, Ye.N., red.; ERASTOVA, N.V., tekhn.red.

[Marine radar] Morskie radiolokatsionnye stantsii. Leningrad, Gos.soiuznoe izd-vo sudostroit.promyshl., 1959. 223 p. (Radar) (MIRA 12:4)

BELOTSERKOVSKIY, GRIGORIY BENTSIONOVICH

Radiolokatsionnyye Ustroystva. Moskva, Oborongiz, 19[illegible]1.

431 p . Illus., Diagrs., Graphs, Tables.

Bibliography: p. 427-428

BELOTSERKOVSKIY, Grigoriy Bentsionovich; SAYBEL', A.G., kand. tekhn.nauk, dotsent, retsenzent; SALGANIK, P.O., kand. tekhn. nauk, red.; BOGOMOLOVA, M.F., red. izd-va; PUKHLIKOVA, P.A., tekhn. red.

[Radar apparatus] Radiolokatsionnye ustroistva. Moskva, Gos. nauchno-tekhn. izd-vo Oborongiz, 1961. 431 p. (MIRA 14:6)
(Radar)

BELOTSERKOVSKIY, Grigoriy Bentsionovich; BABKIN, N.I., inzh., retsenzent; ZHDANOV, V.K., inzh., retsenzent; KALANTAROV, M.N., inzh., retsenzent; TELEZHKO, M.I., inzh., retsenzent; FAKTOROVICH, M.D., inzh., retsenzent; FEDOTOV, M.D., inzh., retsenzent; SAMOYLOV, G.V., inzh., red.; IVANOV-TSYGANOV, A.I., kand. tekhn. nauk, red.; BOGOMOLOVA, M.F., red. izd-va; ROZHIN, V.P., tekhn. red.

[Antennas]Antenny. Izd.2., perer. i dop. Moskva, Oborongiz, 1962. 491 p. (MIRA 16:2)
(Antennas (Electronics))

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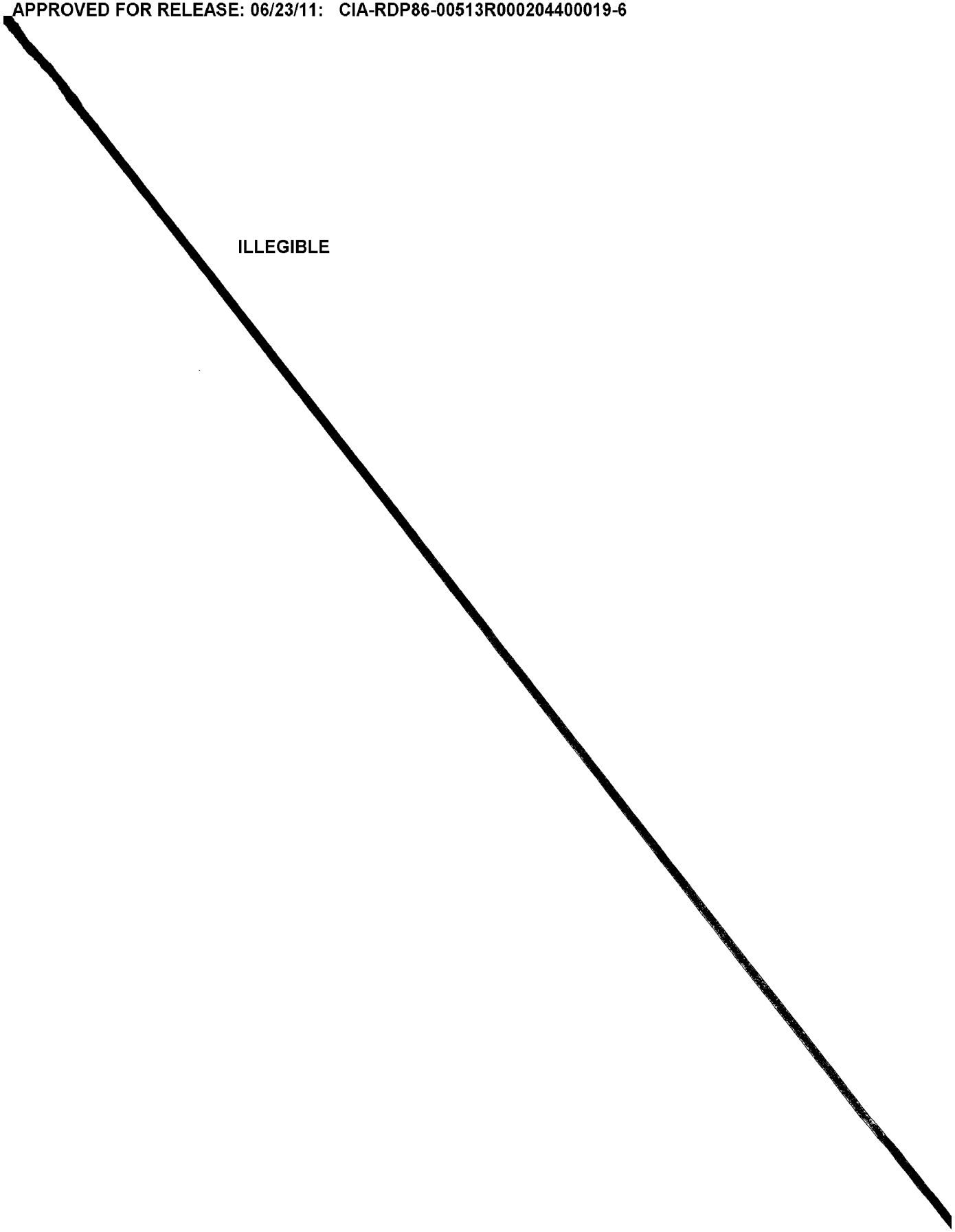

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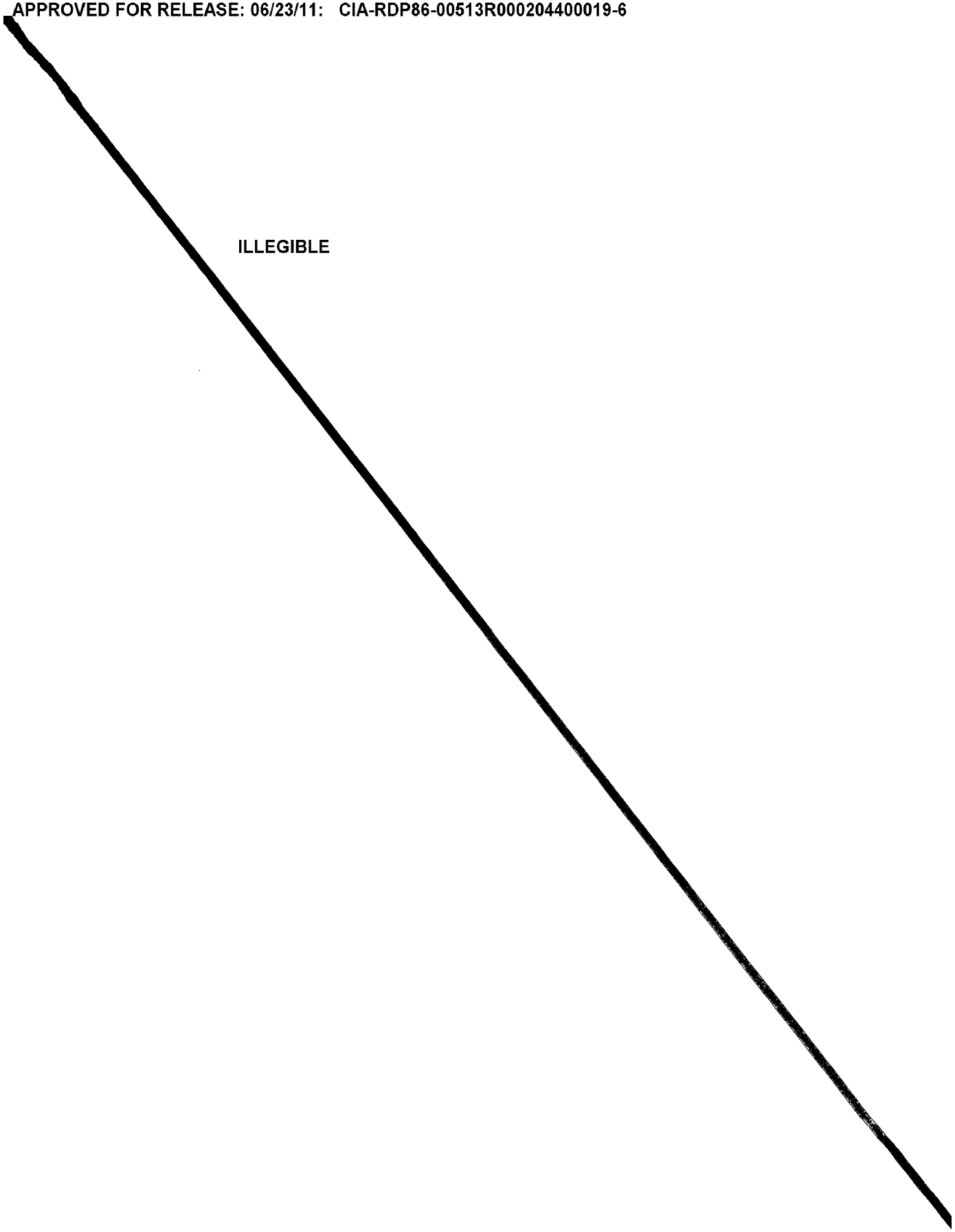

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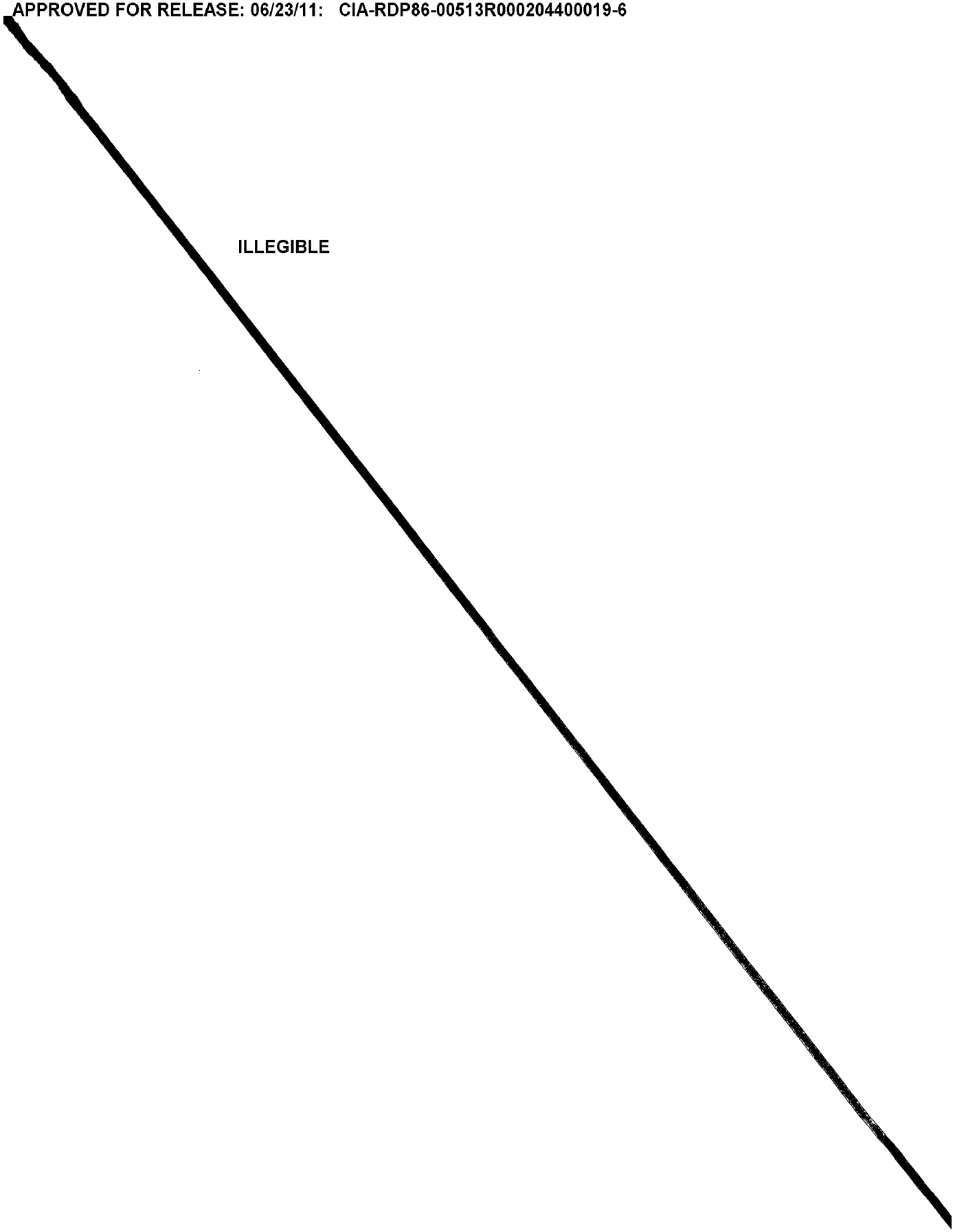

BELOTSERKOVSKIY, Grigoriy Bentsionovich; REYFMAN, L.L., retsenzent; CHEFRANOV, A.S., retsenzent; RAKOV, V.I., doktor tekhn. nauk, nauchn. red.; KOVCHKINA, G.P., red.

[Principles of pulse techniques and radar] Osnovy impul'snoi tekhniki i radiolokatsii. Leningrad, Sudostroenie, 1965. 458 p. (MIRA 18:7)

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ACC NR: AM5026036 Monograph UR/

Belotserkovskiy, Grigoriy Saptsionovich

Principles of pulse engineering and radar (Osnovy impul'snoy tekhniki i radiolokatsii) Leningrad, Izd-vo "Sudostroyeniya," 1964. 438 p. illus., biblio. 13,900 copies printed.

TOPIC TAGS: electronic circuit, trigger circuit, pulse amplifier, pulse generator, transistorized circuit, radar system, radar tracking range, radar jamming

PURPOSE AND COVERAGE: This book has been approved by the Ministry of Higher and Secondary Special Education as a textbook in radio engineering technicums and was written in accordance with the approved curriculum of the course "Fundamentals of radar." The first part describes the circuit-diagrams intended for generation, amplification, and conversion of electric pulses. The physical nature of pertinent processes is explained and calculation relationships for pulse networks using either tubes or transistors are established. Examples of pulse circuit designs are given. The second part deals with the theory of radar. Target coordinate finding methods are discussed, principles of indicator device operation, networks for automatic coordinate measurements, and problems of coupling radar stations with electronic digital computers are described. In the conclusion, radar

UDC: 621.396.96

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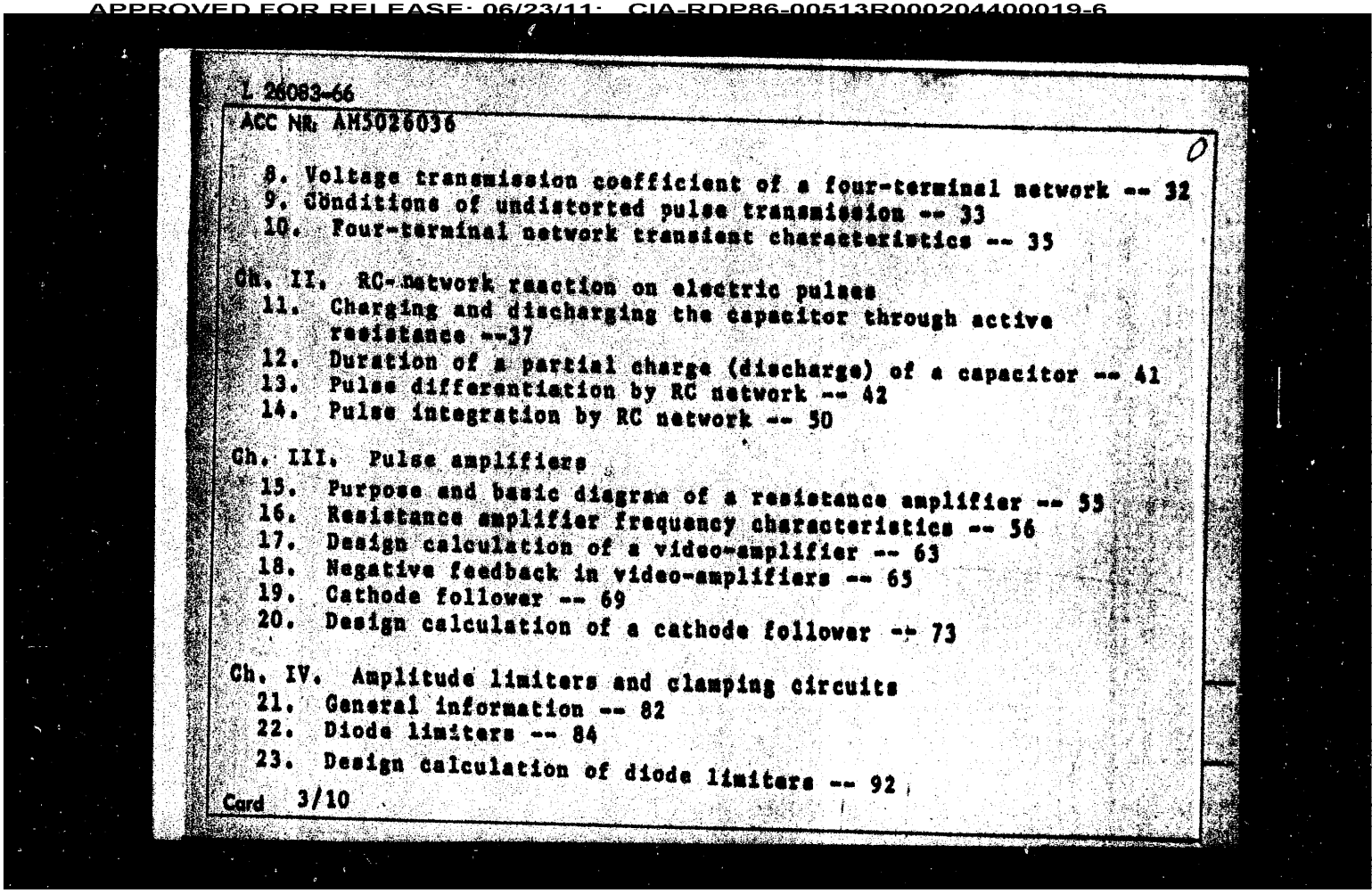
interference and preventive measures that have been employed are cited. V. T. Rakov, Professor, Doctor of Technical Sciences, edited the book and gave the author a series of valuable suggestions. A. S. Chefranov, Candidate of Technical Sciences, and L. L. Reyfman offered criticism and useful recommendations.

TABLE OF CONTENTS:



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Bibliography -- 460

AVAILABLE: Library of Congress

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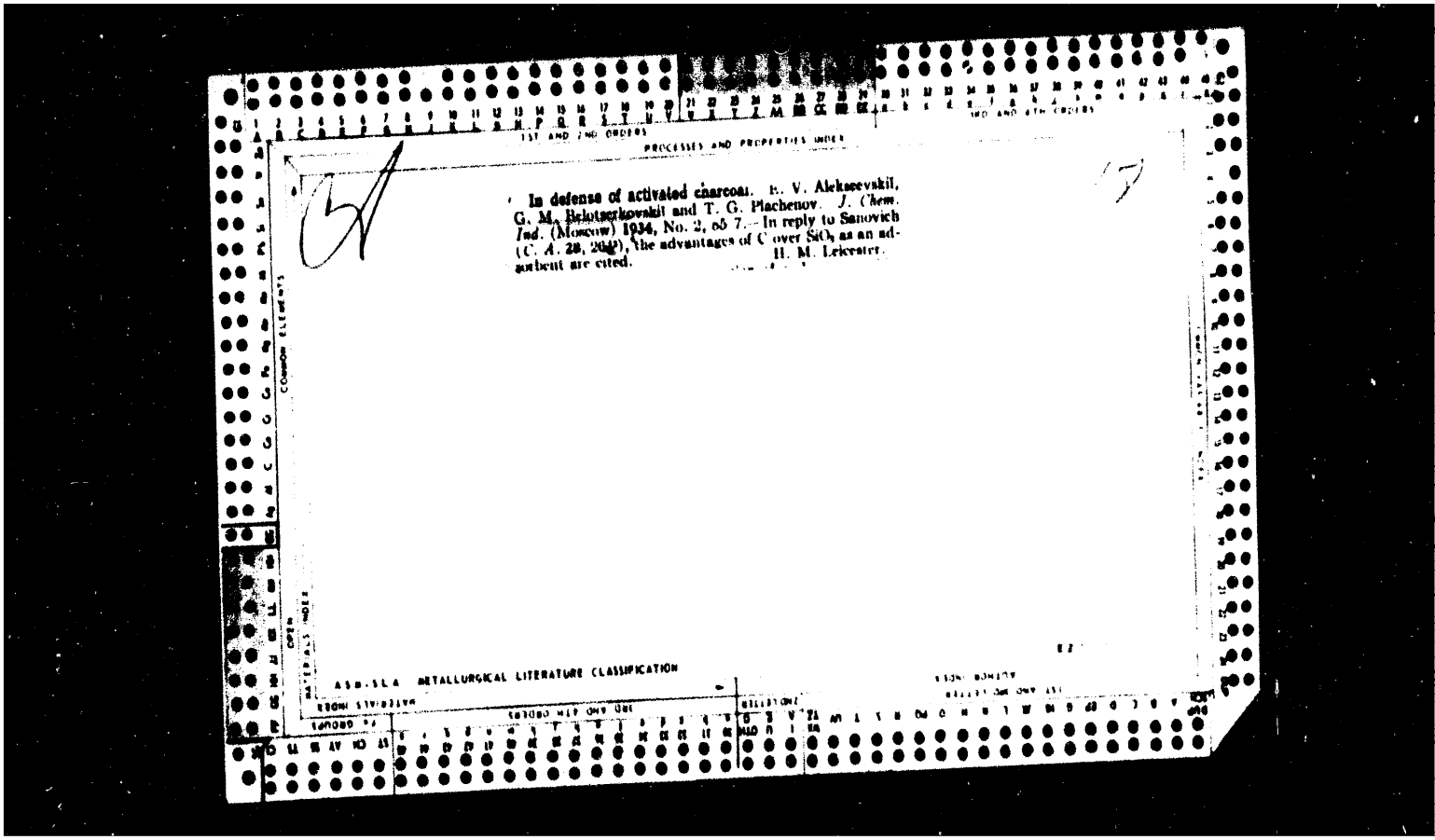

PROCESSES AND PROPERTIES INDEX

In defense of activated charcoal. E. V. Alekseevskii, G. M. Belotserkovskii and T. G. Plachenov. *J. Chem. Ind.* (Moscow) 1934, No. 2, 65 7.—In reply to Sanovich (*C. A.* 28, 2042), the advantages of C over SiO_2 as an adsorbent are cited. H. M. Leicester.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Adsorption of vapors by gels of aluminum and ferric hydroxides and titanium dioxide. I. II. P. V. Alekseevskii and G. M. Bekhterkovskii. *J. Gen. Chem.* (U. S. S. R.) **6**, 370-81, 382-9 (1936).—In prepg. Al_2O_3 *gels* by addn. of NH_3 to $Al_2(SO_4)_3$ the intensity of agitation and variations in concns. of NH_3 (2-20%) and $Al_2(SO_4)_3$ (0.14-0.16 *M*) solns. have no effect on gel structure. Best results are obtained by pptg. the gel at 50-60°. Drying at room temp. for 10-25 days reduces the vol. of washings without harmful effects. After washing, the gel is dried for a considerable length of time first at room temp. and then at 50-60° until the water content is reduced to 50-80%. Quick drying at elevated temps. pulverizes the gel. The temp. is then raised to 100-110°. Gels dried below 100° disintegrate in contact with water. The best activation temp. is 350-400°. In prepg. Fe_2O_3 *gels* 20% NH_3 soln. is added to a warm soln. of $Fe_2(SO_4)_3$. The gel is washed with water first by decantation and then on a Buchner funnel. After drying for 15 days at room temp. over P_2O_5 and under vacuum, the gel is transferred to a drying oven held at 90°. The best activation temp. is 300°. In prepg. TiO_2 *gels* TiO_2 is dissolved in hot concd. H_2SO_4 which is then dild. with water. The gel is ppted. by heating and stirring with a 20% NH_3 soln. After thorough washing with water by decantation coagulation is finally accomplished with a small amt. of AcOH. The gel is again washed on a Buchner funnel and dried at 100-110°. It is best activated at 300°. *Dynamic activity of gels* was detd. in a modified app. of Dubinin, Lukopov and Chmutov (C. A. **26**, 3186). The porosity of Al_2O_3 gel is the same as that of Fe_2O_3 or TiO_2 gels but the pores are smaller, which accounts for its high activity. Adsorption of CCl_3NO_2 at 25° and CCl_4 vapors at 18° by Al_2O_3 gel confirms isotherms of Freundlich and Langmuir but Fe_2O_3 gel behaves differently. Expts. with C_6H_6 vapors show that Al_2O_3 gel gives better protection than Fe_2O_3 gel. Al_2O_3 gel is also a better drying agent than even P_2O_5. Adsorption of water vapors by Al_2O_3 gel (static method) at 15° follows the isotherm of Freundlich but not that of Langmuir. Static and dynamic methods of measuring adsorption of water vapors by Al_2O_3, Fe_2O_3 or SiO_2 gels give identical results. V. A. Kalichevsky

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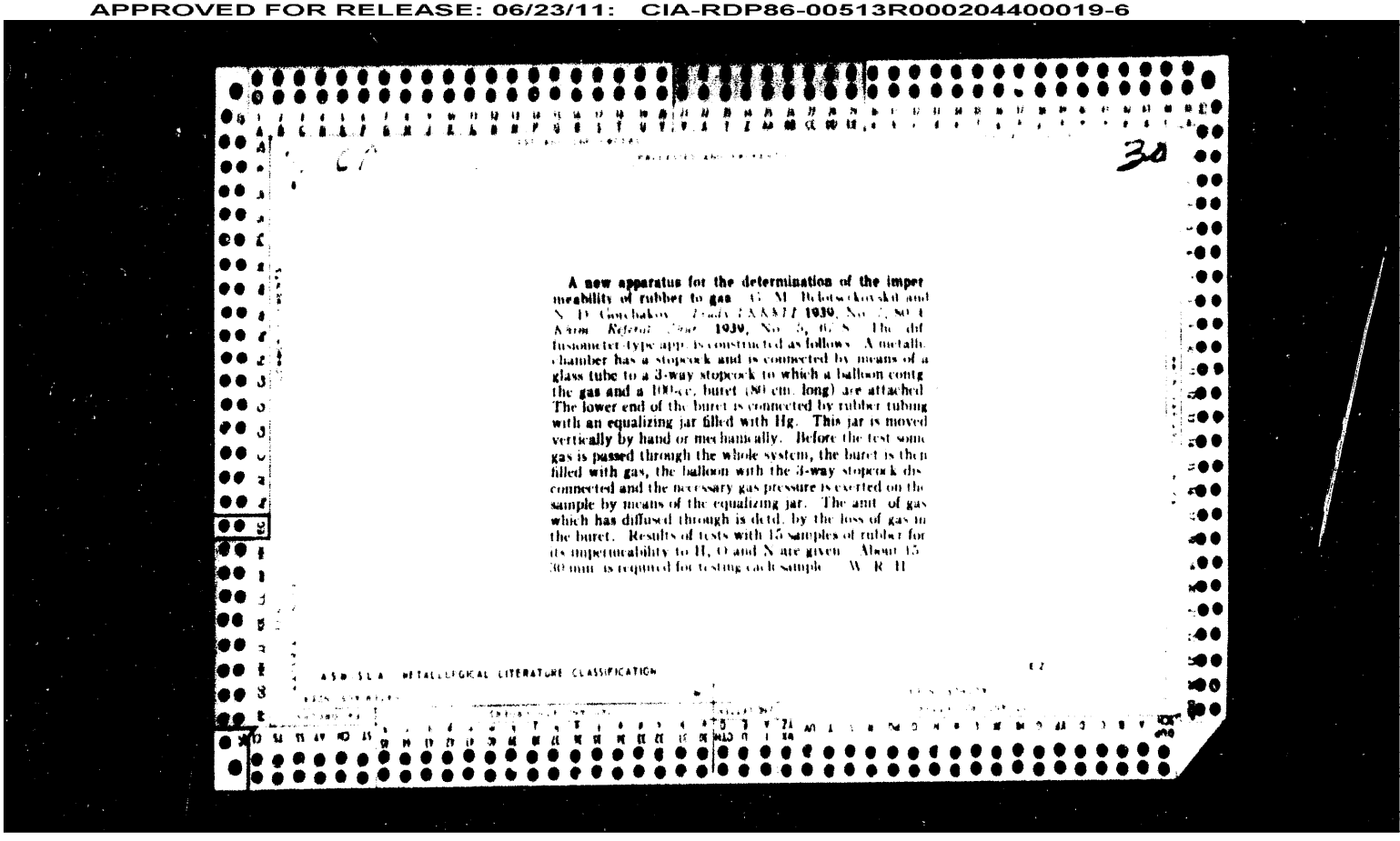
Dynamics of sorption of nitric acid vapors by activated charcoal. O. M. Reinsturkhyskii and A. A. Golovanova. *Trudy LKKhTI (Leb. Kolloidnoi Khim.)* **1939**, No. 7, 66–84; *Khim. Referat. Zhur.* 2, No. 5, 16–17(1939).— Much exptl. data was obtained, by means of which the dependence of the degree of the utilization of the static capacity of the sorbent (activated charcoal), in the process of its dynamic activity, can be calcd. from the length of the layer, from the concn. and from the velocity of the steam-air current. At a velocity of 1–2 l./min./sq. cm., the exptl. results obey closely the Shilov and Mekhenburg equation. Deviations (observed at lower velocities) are explained by chemisorption. The static capacity of the sorbent shows a considerable dependence on length of the layer and velocity of the current, but depends only very little on the concn. of HNO_3 vapors. W. R. H.



A new apparatus for the determination of the impermeability of rubber to gas G. M. Bebutov, Chuvakin and N. D. Gorchakov. *Zavod. Lab.* **1939**, No. 7, 80-4. Abstr. *Referat. Zhur.* **1939**, No. 5, 66-8. The diffusometer-type apparatus is constructed as follows. A metallic chamber has a stopcock and is connected by means of a glass tube to a 3-way stopcock to which a balloon containing the gas and a 100-cc. buret (80 cm. long) are attached. The lower end of the buret is connected by rubber tubing with an equalizing jar filled with Hg. This jar is moved vertically by hand or mechanically. Before the test some gas is passed through the whole system, the buret is then filled with gas, the balloon with the 3-way stopcock disconnected and the necessary gas pressure is exerted on the sample by means of the equalizing jar. The amt. of gas which has diffused through is detd. by the loss of gas in the buret. Results of tests with 15 samples of rubber for its impermeability to H, O and N are given. About 15-30 mm. is required for testing each sample. W. R. H.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

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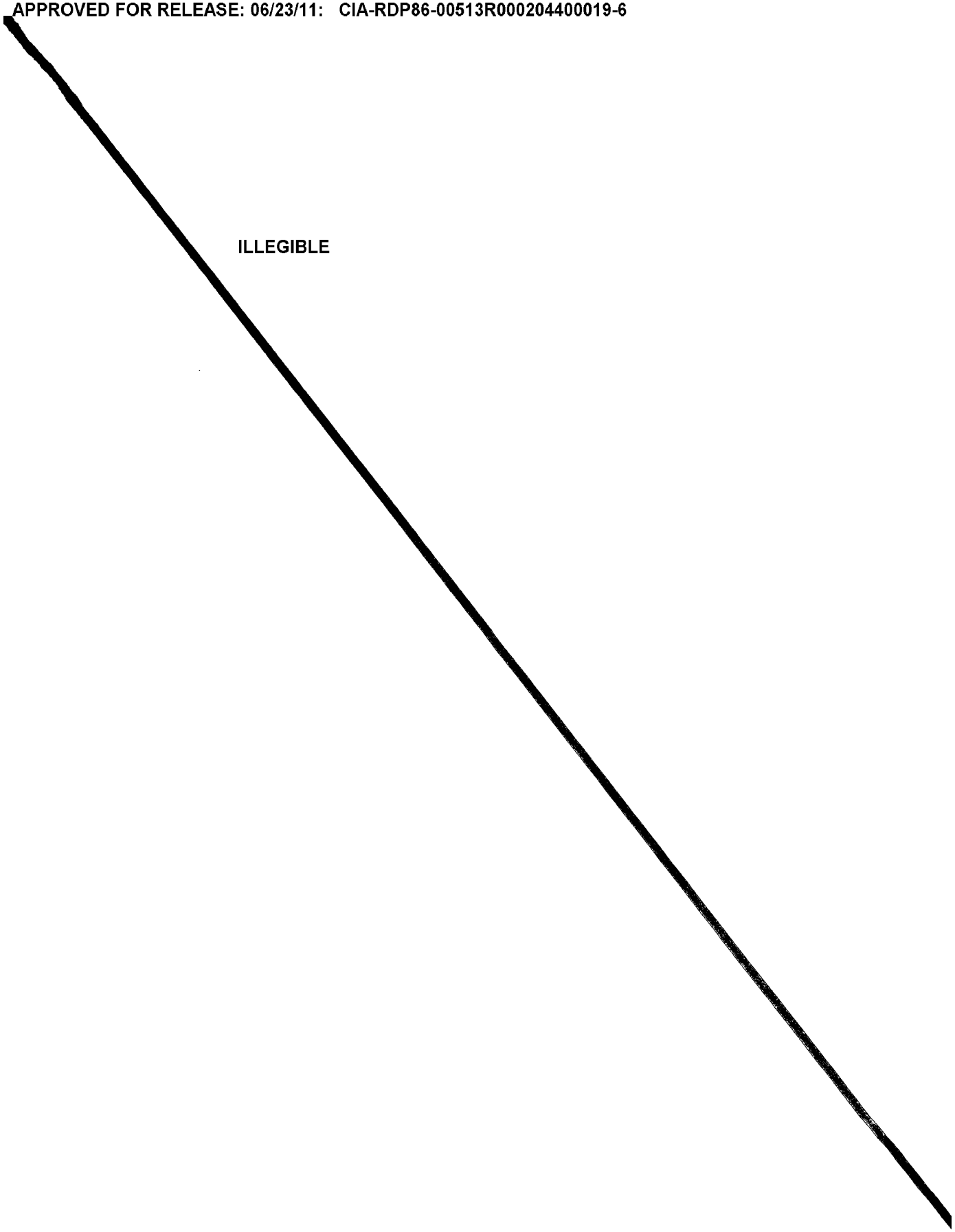

BELOTSERKOVSKIY, G.M.; LEVIT, R.M.

Adsorption of carbon disulfide by activated carbon. Khim.volok. no.2:40-44 '62. (MIRA 15:4)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta (for Belotserkovskiy). 2. Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta iskusstvennogo volokna (for Levit).
(Carbon disulfide) (Carbon, Activated)

BELOTSERKOVSKIY, G.M.

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PHASE I BOOK EXPLOITATION SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye (Synthetic Zeolites: Production, Investigation, and Use). Moscow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady) Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor of Chemical Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P. Golub'.

PURPOSE: This book is intended for scientists and engineers engaged in the production of synthetic zeolites (molecular sieves), and for chemists in general.

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Synthetic Zeolites: (Cont.) SOV/6246

COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

ZHDANOV, S.P., dokt. khim.nauk; BELOTSERKOVSKIY, G.M., kand. khim.nauk

Research on zeolites; second all-Union conference in Leningrad.
Vest. AN SSSR 34 no.9:135-137 S '64. (MIRA 17:12)

BARACHEVSKIY, V.A.; KHOLMOGOROV, V.Ye.; BELOTSERKOVSKIY, G.M.; TERENIN, A.N.

Spectral study of the specific nature of an active Al_2O_3 surface.
Kin. i kat. 6 no.2:258-268 Mr-Ap '65. (MIRA 18:7)

1. Leningradskiy gosudarstvennyy universitet i Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

BELOTSERKOVSKIY, G.M.; LEVIT, R.M.

Studying the dynamics of carbon disulfide and hydrogen sulfide sorption from concentrated mixtures. Khim. volok. no.5:42-45 '65. (MIRA 18:10)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta (for Belotserkovskiy). 2. Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta iskusstvennogo volokna.

BELOTSERKOVSKIY, G.M.; LEVIT, R.M.

Determining the coefficient of hydrogen sulfide displacement by carbon disulfide. Khim. volok. no.6:44-46 '65.

(MIRA 18:12)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta (for Belotserkovskiy). 2. Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta iskusstvennogo volokna (for Levit).

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204400019-6

BELOTSERKOVSKIY, G. V.

NELEPETS, V.S., kandidat tekhnicheskikh nauk, dotsent; BELOTSERKOVSKIY, G.V., inzhener; BOGOMOLOVA, A.F., redaktor; GLADKIKH, N.N., tekhnicheskiy redaktor.

[Principles of radar] Osnovy radiolokatsii. Moskva, Gos. izd-vo oboronnoi promyshlennosti, 1954. 303 p. (MLRA 8:1)
(Radar)

GITMAN, F., kand.tekhn.nauk; BELOTSERKOVSKIY, I., kand.fiz.-matem.nauk

Installing a foundation with antivibration mountings for a drop hammer. Prom. strei. i inzh. soor. 4 no.1:29-31 Ja-F '63. (MIRA 16:3)
(Machinery—Foundations)

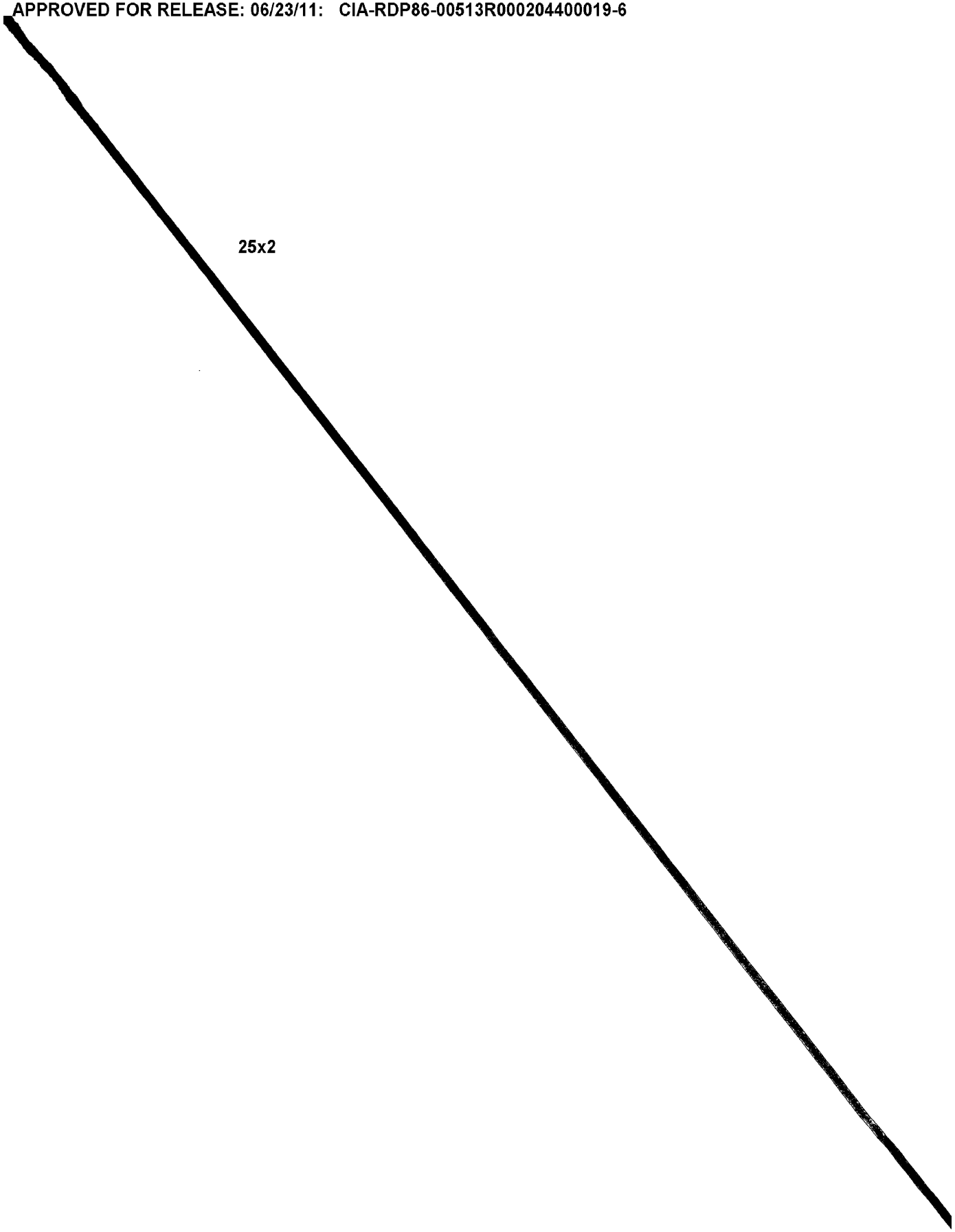
BELOTSERKOVSKIY, I.G.; CHENTEMIROV, M.G.; SHUMENKOV, P.P.; MAKSIMOV, N.P., nauchnyy red.; GERASIMOVA, G.S., red. izdpva; BOROVNEV, N.K., tekhn. red.

[New developments in planning labor in construction; practices of the Kuybyshev Economic Council]Novoe v planirovanii truda v stroitel'stve; opyt Kuibyshevskogo sovnarkhoza. Moskva, Gosstroiizdat, 1962. 57 p. (MIRA 15:9)
(Kuibyshev Province—Construction industry—Labor productivity)

BELOTSERKOVSKIY, I.G.; USPENSKIY, V.V., kand. ekon. nauk, nauchn. red.; GLAZUNOVA, Z.M., red.; GOL'BERG, T.M., tekhn. red.

[Economic analysis of the production and management operations of subcontracting construction organizations; practice of Kuybyshev construction organizations] Ekonomicheskii analiz proizvodstvenno-khoziaistvennoi deiatel'nosti podriadnykh stroitel'nykh organizatsii; opyt kuibyshevskikh stroitel'nykh organizatsii. Moskva, Gosstroiizdat, 1963. 109 p. (MIRA 16:12)

(Kuybyshev--Construction industry--Management)



BELOTSERKOVSKIY, I.Ya., dotsent; GITMAN, F.M., kandidat tekhnicheskikh nauk.

Experimental testing of the performance of trestle bridges. Stroi. prom. 31 no.11:46 N '53. (MLRA 6:12)
(Railroad bridges) (Trestles)

BELOTSERKOVSKIY, I.Ya.; SHAYKEVICH, V.I.

Effect of dynamic action on structural elements of scrap metal plants. Prom. stroi. 41 no.1:24-27 Ja '64. (MIRA 17:6)

1. Dnepropetrovskiy inzhenerno-stroitel'nyy institut.

IZMAYLOV, A.; BELOTSERKOVSKIY, L.

Work experience of the commission on labor protection. Metallurg 8 no.10:34-35 O '63. (MIRA 16:12)

1. Chlen komissii okhrany truda Azerbaydzhanskogo truboprokatnogo zavoda (for Izmaylov). 2. Starshiy inzh. otdela tekhniki bezopasnosti Azerbaydzhanskogo truboprokatnogo zavoda (for Belotserkovskiy).

BELOTSERKOVSKIY, L.I.

Readers' conference of the Kazakh Republic section of the All-Union Society of Hygienists and Sanitary Physicians. Gig. i san. 26 no.5: 115 My '61. (MIRA 15:4)

(PUBLIC HEALTH--PERIODICALS)

BELOTSERKOVSKIY, Leonid Panteleyevich; MANAFOV, Gulam ; RASHEVSKAYA, T.A., red.; TOROSYAN, R., tekhn. red.

[Safety measures in piperolling mills] Tekhnika bezopasnosti v truboprokatnom proizvodstve. Baku, Azerbaidzhanskoe gos.izd-vo, 1963. 73 p. (MIRA 16:10)
(Pipe mills--Safety measures)

AUTHORS: Garder, V. and Belotserkovskiy, M., Engineers SOV/66-59-1-22/32

TITLE: Installation of Relay of the RTP-1 Type in Household Refrigerators "DNEPR" (Ustanovka rele tipa RTP-1 v domashnikh kholodil'nikakh "DNEPR")

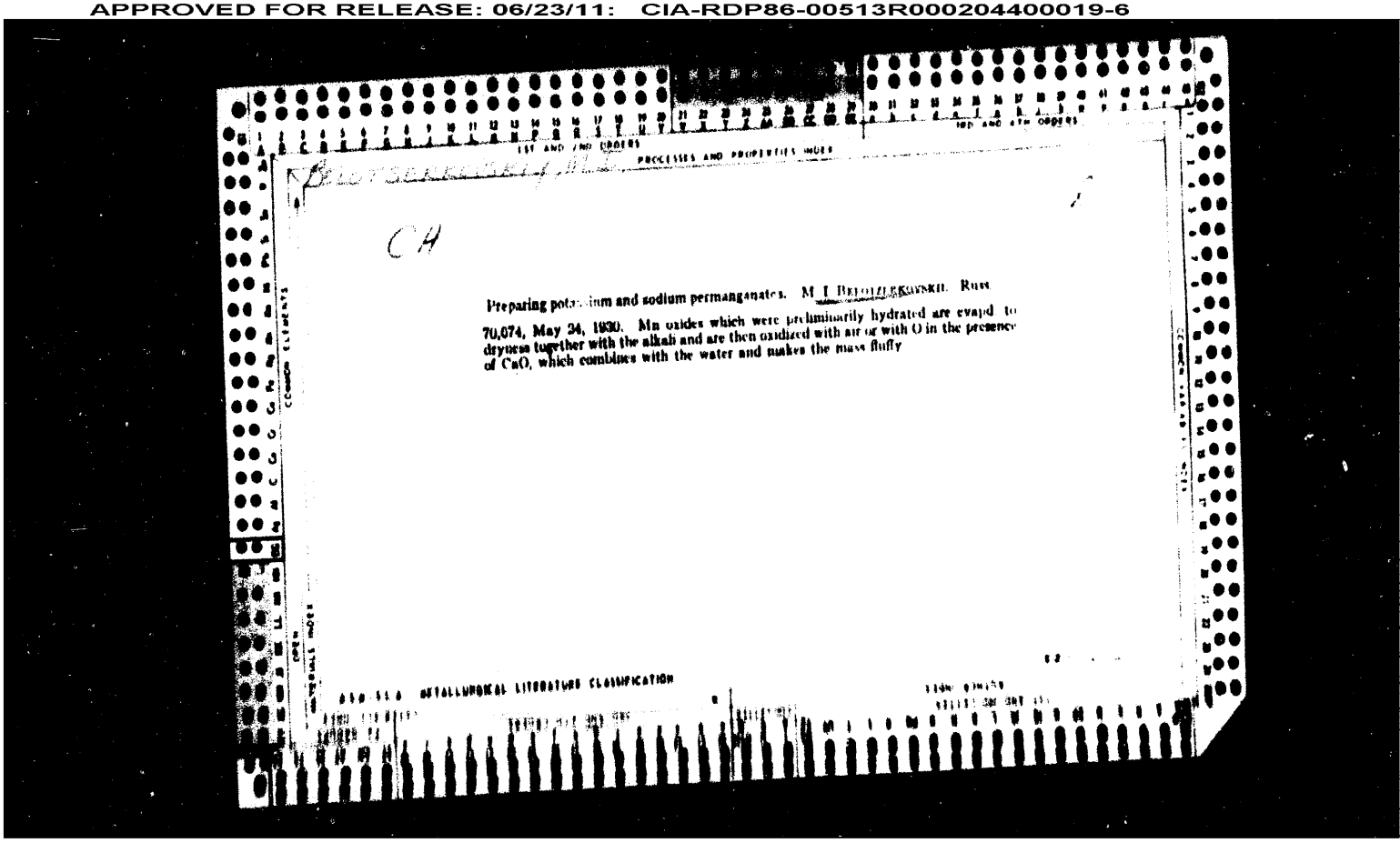
PERIODICAL: Kholodil'naya tekhnika, 1959, Nr 1, pp 34-35 (USSR)

ABSTRACT: The latest series of household refrigerators "DNEPR" are equipped with starting and thermal relay of the new RTP-1 type, which in design and performance is superior to the former DKhR-3 type. Being also simpler and more reliable, the new relays can readily be mounted on the old refrigerators in place of the obsolete relays, also on the refrigerators "Zil-Moskva" and "Saratov-2". The article describes how this work can be done by an ordinary mechanic.
There are 4 diagrams.

Card 1/1

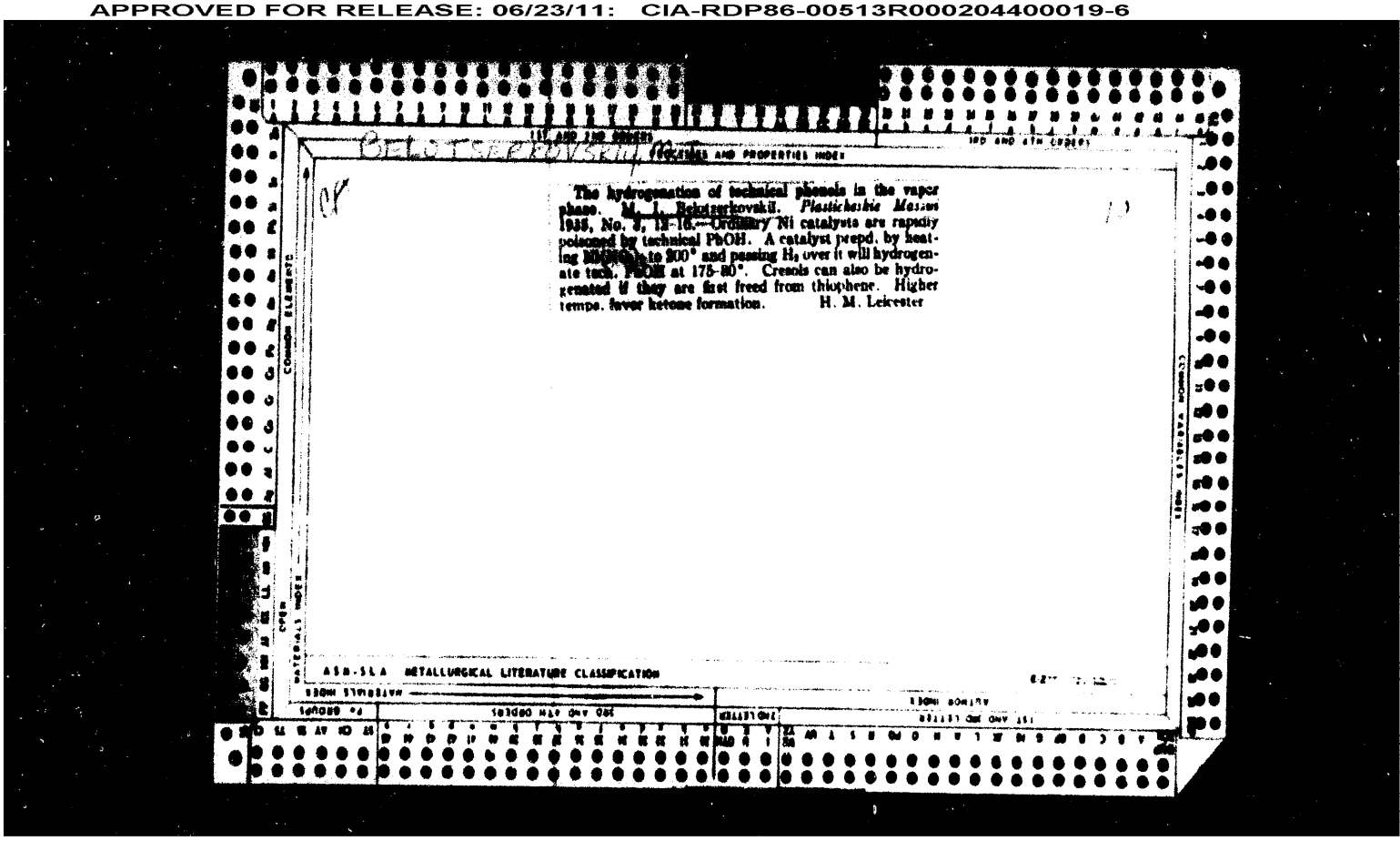
BELOTSERKOVSKIY, M.A.

Methodological instructions on standardization. Standartizatsiia 28 no.2:51 F '64. (MIRA 17:3)



CH

Preparing potassium and sodium permanganates. M I Belopolskii. Russ
70,074, May 24, 1930. Mn oxides which were preliminarily hydrated are evapd to
dryness together with the alkali and are then oxidized with air or with O in the presence
of CaO, which combines with the water and makes the mass fluffy



The hydrogenation of technical phenols in the vapor phase. M. I. Bolotnikovskii. *Plasticheskie Massy* 1935, No. 3, 12-16.—Ordinary Ni catalysts are rapidly poisoned by technical PhOH. A catalyst prepd. by heating [illegible] to 300° and passing H_2 over it will hydrogenate tech. PhOH at 175-80°. Cresols can also be hydrogenated if they are first freed from thiophene. Higher temps. favor ketone formation. H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BELOTSERKOVSKIY, M.Ye., inzhener; LEVITAS, I.E., inzhener

Obtaining extracts of a given basicity. Leg. prom. 15no.4: 49-51 Ap '55. (MLRA 8:7)
(Tanning)

BABKINA, V.G.; ZURABYAN, K.M.; OSTROVSKIY, V.S.; RABINOVICH, Ya.M.; BELOTSERKOVSKIY, M.Ye.

Liming of pig skins with a reduced quantity of sodium sulfide. Kozh.-obuv.prom. 5 no.2:21-22 F '63. (MIRA 16:5)
(Leather)

BELOTSERKOVSKIY, Mark Yul'yevich; PETROV, A.A., redaktor; MAYBORODA, M.I., [illegible]

[Mal'tsev tillage system and local growing conditions] Obrabotka pochvy po sisteme T.S.Mal'tseva i mestnye prirodnye usloviia. Moskva, Izd-vo M-va sel'skogo khoz. SSSR, 1957. 30 p. plates. (Tillage) (MLRA 10:10)

BELOTSERKOVSKIY, M.Yu.

Reflection of the tasks of the seven-year-plan for the economic development of the U.S.S.R. by the exhibits of the Museum of Earth Science. Zhizn' Zem. no.1:122-129 '61. (MIRA 15:6)
(Natural resources) (Moscow—Geographical museums)

BELOTSERKOVSKIY, M.Yu.

Maps of natural resources and their utilization; new method in geographical territorial characterization. Zhizn' Zem. no.1:170-177 '61. (MIRA 15:6)

(Geography, Economic--Maps)

IVANOV, K.I., red.; BELOTSERKOVSKIY, M.Yu., red.; BOLYSHEV, N.N., red.; GEDYMIN, A.V., red.; GLAZOVSKAYA, M.A., red.; GOLOVENKO, S.V., red.; ZVORYKIN, K.V., red.; IGNAT'YEV, G.M., red.; KUZNETSOV, G.A., red.; LEBEDEV, N.P., red.; LEBEDEV, P.N., red.; RAKITNIKOV, A.N., red.; SHEYNIN, L.B., red.; GREBTSOV, P.P., red.; YERMAKOV, M.S., tekhn. red.

[Accounting for and the evaluation of agricultural land] Uchet i otsenka sel'skokhoziaistvennykh zemel'. Pod red. K.I. Ivanova. Moskva, Izd-vo Mosk. univ., 1963. 385 p. (MIRA 16:7)

(Farm--Valuation) (Soils--Classification) (Cadasters)

BELOTSERKOVSKIY, M.Yu.; DIK, N.Ye.; DOBRONRAVOVA, K.I., red.; PAVLOV, V.N., red.; BELICHENKO, R.K., mladshiy red.; POLOZHENTSEVA, T.S., mladshiy red.

[Our native land Siberia; photo album] Nasha Rodina Sibir'; fotoal'bom. Moskva, Izd-vo "Mysl'," 234 p.

PA - 3128

AUTHOR BELOTSERKOVSKIY O.M.

TITLE The Flow round a Circular Cylinder with a shock wave.
(Obtekaniye krugovogo tsilindra s otoshedshey udarnoy volnoy.-
Russian.)

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 3, pp 509-512 (USSR).
Received: 6/1957 Reviewed: 7/1957

ABSTRACT With the help of electronic computers this problem can be solved with sufficient accuracy if the problem is precisely set.
The Problem: A plane parallel supersonic flow ($M_\infty > 1$) of a perfect gas is assumed to flow with the constant velocity w_∞ towards a circular cylinder. Before the cylinder a shock wave turns up, the shape and position of which are, at first, unknown. The author here investigates a system of an equation of motion, continuity equation, and energy equation. Also the boundary conditions for the body are given.
The Method of Solution: The author solves the present problem by the method of integralrelations developed by A.A. DORODNITSYN, works of the third Allsoviet Mathematical Congress vol 2, 1956.
Results of Computations: By means of the electronic computer BESM the flow round a circular at different M_∞ was computed in first, second, and partly also in third approximation. A diagram shows

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The Flow round a Circular Cylinder with a shock wave.

for the case $M_\infty = 3$ the shock wave constructed in third approximation, the sound line ($M = 1$), and the characteristics. The image of the flow obtained in second approximation is very similar to that obtained in second approximation. Further diagrams show the waves and sound lines for the cases $M_\infty = 3$ (III. approximation), 4,0 and 5,0 (II. approximation). Finally, a diagram illustrates the convergence of the method with respect to the approximations at $M_\infty = 3$.

The same diagram also shows a comparison with the experiment carried out by G.M. RYABNIKOV. Already the second approximation gives results of sufficient accuracy. By the computations discussed here it is possible to compute the pressure on the surface and outside the body, the sound line, the characteristics, the position and the shape of the shock wave, etc. In a similar manner the problem of the flow round plane or spatial bodies (with a shock wave that has moved away) of any axially symmetric form can be solved.
(With 3 Illustrations)

ASSOCIATION: Computing center of the Academy of Science of the USSR.
PRESENTED BY: A.A. DORODNITSYN, Member of the Academy, 23.10. 1956.
SUBMITTED: 20.10. 1956.
AVAILABLE: Library of Congress.

CARD 2/2

BELOTSERKOVSKIY, O. M.

"The Flow Round the Arbitrary Symmetric Profile with Detached Bow Wave."

dissertation defended for the degree of Cand. of Phys-Math. Sci. at the Inst. for Mathematics im V. A. Steklov,

Defense of Dissertations (Jan-Jul 1957)
Section of Physical Math. Sci.
Vest. AN SSSR, v. 27, No. 12, 1957, pp. 108-9

BELOTSERKOVSKIY, S.M.

AUTHOR: [illegible] PHASE I BOOK EXPLOITATION SOV/5365

Akademiya nauk Azerbaydzhanskoy SSR

Tezisy dokladov Soveshchaniya po vychislitel'noy matematike i primeneniyu sredstv vychislitel'noy tekhniki (Outlines of Reports of the Conference On Computational Mathematics and the Use of Computer Techniques) Baku, 1958. 63 p. 400 copies printed.

Additional Sponsoring Agencies: Akademiya nauk SSSR. Vychislitel'nyy tsentr, and Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

No contributors mentioned.

PURPOSE: This book is intended for pure and applied mathematicians, scientists, engineers and scientific workers, whose work involves computation and the use of digital and analog electronic computers.

COVERAGE: This book contains summaries of reports made at the Conference on Computational Mathematics and the Application of Computer Techniques. The book is divided into two main parts. The first part is devoted to computational mathematics and contains 19 summaries of reports. The second section is devoted to computing techniques and contains 20 summaries of reports. No personalities are mentioned. No references are given.

AVAILABLE: Library of Congress (QA75.S7)

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4-13-60

Card 7/7

BELOTSERKOVSKIY, O.M.

Calculating the flow around a circular cylinder with a detached shock wave. Vych.mat. no.3:149-185 '58. (MIRA 12:1)
(Aerodynamics)

40-22-2-8/21

AUTHOR: Belotserkovskiy, O.M. (Moscow)

TITLE: The Flow Around a Symmetric Profile With a Decreasing Shock Wave (Obtekaniye simmetrichnogo profilya s otoshedshey udarnoy volnoy)

PERIODICAL: Prikladnaya matematika i mekhanika, 1958 Vol 22, Nr 2, pp 206-219 (USSR)

ABSTRACT: In the treatments of the same problem up to now by other authors there were nearly always made approximations for the solution of the equations of flow. The author tries to give a solution with the aid of a method given by Dorodnitsyn. In this method the integration of the system of non-linear partial differential equations is reduced to the numerical solution of an approximating system of ordinary differential equations. Under application of electronic computers this method renders possible to calculate the results with an exactness sufficient for practice.

The author considers the flow around a plane body of arbitrary form by a shock wave. The body possesses an axis of symmetry. It is flown on by a plane, parallel supersonic flow of an ideal gas under the angle of incidence 0. Before the body a shock

Card 1/2

The Flow Around a Symmetric Profile With a Decreasing Shock Wave

40-22-2-8/21

wave arises, the form of which is not known at first. A calculation in the critical domain is now carried out which is given by the shock wave on the one hand and by the contour of the body on the other hand.
For the case of the flow around a circular cylinder the calculations are explicitly carried out, and the results are represented in diagrams and tables.
There are 7 figures, 4 tables, and 11 references, 4 of which are Soviet, 4 American, 2 Japanese, and 1 German

SUBMITTED: November 30, 1957

1. Shock waves--Mathematical analysis 2. Gas flow--Mathematical analysis

Card 2/2

BELOTSERKOVSKIY, O.M.

82121
S/040/60/024/03/08/020
C 111/ C 333

11.7600 16.6500

AUTHOR: Belotserkovskiy, O. M. (Moscow)

TITLE: The Calculation of the Flow Around Axialsymmetric Bodies With Detached Shock Wave on an Electronic Computer

PERIODICAL: Prikladnaya matematika i mekhanika, 1960, Vol. 24, No. 3, pp. 511-517

TEXT: For the solution of the problem mentioned in the title in most cases the form and position of the shock wave are given, and then the inverse problem is solved. The author reports on the solution of the direct problem carried out with the aid of the computing machine BESM - 1 according to the method of A. A. Dorodnitsyn (Ref.2) in the computing center of the Academy of Sciences of the USSR. The plane problem was already treated by the author in (Ref.3), and the case $M_\infty = 1$ by P. J. Chushkin in (Ref.4). In the present paper the author gives calculation schemes and numerical results of calculation for some bodies (ellipsoid, sphere, disk). At first he sets up the non-dimensional hydrodynamic equations, introduces the Bernoulli integral and the stream function and writes down the boundary conditions. The

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C 111/ C 333

The Calculation of the Flow Around Axialsymmetric Bodies With Detached Shock Wave on an Electronic Computer

established system of partial differential equations is replaced by an approximating ordinary system according to (Ref.2). Here the domain of integration is subdivided as in (Ref.3): between body and shock wave there are led N - 1 intermediate curves. Then the initial system is integrated from the body to the intermediate curves for fixed remaining coordinate, the remaining simple equations are written along the intermediate curves. The integrands are replaced by interpolation polynomials, it is integrated and the approximating system is obtained. The unknowns are the values of the initial functions on the strip boundaries. The results of the numerical treatment of the approximating system are given in some cases. For the performance of the calculations the author thanks N. P. Shulishnina, Scientific Collaborator, N. N. Mel'tsis, A. J. Bykova and K. J. Vasil'yeva. He mentions V. J. Shul'gin, Scientific Collaborator.

There are 8 figures, 3 tables, and 4 references: 3 Soviet and 1 Dutch.

SUBMITTED: February 1, 1960

Card 2/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204400019-6

BELOTSERKOVSKIY, Oleg Mikhaylovich; CHUSHKIN, P.I., otv. red.; ORLOVA, I.A., red.; POPOVA, N.S., tekhn. red.

[Calculation of flows past axisymmetric bodies in the case of a frontal shock wave; calculation formulae and tables for flow fields] Raschet obtekaniia osesimmetrichnykh tel s otoshedshei udarnoi volnoi; raschetnye formuly i tablitsy polei techenii. Moskva, Vychislitel'nyi tsentr AN SSSR, 1961. 55 p. (MIRA 14:11)

(Aerodynamics—Tables, etc.)

35333
S/194/62/000/001/007/066
D201/D305

10.1200

AUTHORS: Belotserkovskiy, O. M. and Chushkin, P. I.

TITLE: Use of an electronic digital computer for certain problems of high speed aerodynamics

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 1, 1962, abstract 1-1-96u (Tr. Vses. soveshchaniya po vychisl. matem. i primeneniyu sredstv vychisl. tekhn. Baku. AN Azerb SSR, 1961, 39-52)

TEXT: Numerical methods of solving certain problems of aerodynamics (flow) are considered. Depending on the speed of flow, the calculation of streamline at subsonic speeds reduces to analysis of two-dimensional problems of gas dynamics. The method of integral ratios (IR) of A. A. Dorodnitsyn was used in the calculations. The principle is as follows: Each of the equations of gas dynamics in orthogonal coordinates ξ, η may be represented in the general form

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Use of an electronic ...

$$\frac{\partial f}{\partial \xi} + \frac{\partial f}{\partial \eta} + F = 0 \qquad (1)$$

where f, φ, F - known functions of coordinates ξ; η - components of velocity U; V - along the coordinate lines η = const., and ξ = const, of density ρ and pressure p. In the IR method the problem is solved by approximations. In the N-th approximation Eq. (1) integrated, e.g. along the coordinate ξ from ξ = 0 to N lines, is represented by N definite integrals of the form

$$\frac{d}{d\eta}\int_0^{\xi_n} \varphi d\xi - \varphi_n \frac{d\xi_n}{d\eta} + f_n - f_o + \int_0^{\xi_n} F\, d\xi = 0$$

Card 2/5

Use of an electronic ...

All integrand functions ζ are approximated next. This makes it possible to arrive at a system of ordinary differential equations with respect to components of velocities U_n, V_n. This system is numerically integrated on a digital computer using standard programming. There is with it a boundary problem; this problem is solved by trial, using one computer. Power and trigonometrical series were used as interpolation expressions for integrands. The above method was used for evaluating the critical numbers (Mach numbers of the flow at which the speed of sound is attained locally at the body in the stream), for symmetrically streamlined ellipses and ellipsoids. The results obtained show good convergence and adequate accuracy of the method in the given problem. The above method was also used to evaluate the subsonic streamlined symmetrical Zhukovskiy profile at zero attack angle. The IR method is applicable to both plane and axially symmetric flows. The accuracy of evaluation of separate gas-dynamical magnitudes differs and depends on several factors (Mach number, relative body thickness δ, etc.). The IR method was used for solving mixed gas dynamics problems. In special types of flow a part of the boundary of the calculated region is usually

Card 3/ 5

Use of an electronic ...

unknown. The following were investigated: symmetrically streamlined bodies, moving at the speed of sound, streamlining a symmetrical profile by a supersonic gas stream in the presence of a receding shock-wave. Results of the evaluation of supersonic flows are given. The so-called finer method of characteristics (MC) was used, whose error is of the order of a cubic grid step. The method is identical with the well-known method of tangents as used in numerical integration of ordinary differential equations. In this case the values of all functions at the nodal point of the characteristic grid being calculated and determined initially by the method of tangents, are made more accurate by further calculations using the trapezoid formula. The MC was used for the problems of supersonic streamlining of axially symmetrical bodies, as this problem was of great practical interest. The axially symmetrical flow of freely expanding gas, having a flat transition plane, was analyzed, together with the supersonic flow in a ring jet with an axially symmetrical body inside it which produced at the jet output an even supersonic stream. The above methods in conjunction with electronic

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Use of an electronic ...

digital computers can be applied to analogous problems of physics and mechanics. 10 figures. 11 references. / Abstracter's note: Complete translation. /

Card 5/5

S/042/61/016/002/005/005
C 111/ C 222

AUTHORS: Belotserkovskiy O. M., Kibel' I. A., Moiseyev N. N., Khristianovich S. A., Chushkin P. I., and Shmyglevskiy Yu. D.

TITLE: Anatoliy Alekseyevich Dorodnitsyn (on the occasion of his 50th birthday

PERIODICAL: Uspekhi matematicheskikh nauk, v. 16, no. 2, 1961, 189-196

TEXT: A. A. Dorodnitsyn was born on December 2, 1910 in the district Tula. In 1931 he finished the study at the Mining Fuculty of the Petroleum Institute Groznyy. Since 1935 he worked in the Glavnaya geofizicheskaya observatoriya (Geophysical Main Observatory) in Leningrad under the leading of I. A. Kibel' (school of N. Ye. Kochin). In 1939 -- candidate of physical-mathematical sciences. Since 1941 he was in the Tsentral'nyy aerogidrodinamicheskiy institut imeni N. Ye. Zhukovskogo (Central Aerohydrodynamic Institute imeni N. Ye. Zhukovskiy). In 1942 -- Doctor dissertation "Boundary layer in a compressible gas". In 1953 -- member of the Academy of Sciences of the

Card 1/3

S/042/6 /016/002/005/005
C 111/ C 222

Anatoliy Alekseyevich Dorodnitsyn ...

USSR. Since 1955 he is the director of the Vychislitel'nyy tsentr Akademii nauk SSSR (Computing Center of the Academy of Sciences USSR). Educational activity: 1939-1940 - docent at the Chair of Higher Mathematics in the Leningrad Mining Institute; 1944-1946 - Professor at the Chair of Theoretical Aerodynamics of the Moskovskiy aviatsionnyy institut imeni S. Ordzhonikidze (Moscow Aviation Institute imeni S. Ordzhonikidze). Since 1947 - Professor and leader of the Chair of Gas Dynamics of the Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physical-Technical Institute). Furthermore - President of the Komissiya po vychislitel'noy tekhnike AN SSSR (Committee of Computing Technics of the Academy of Sciences USSR); member of the Komitet po Leninskim premiyam (committee for Lenin Prizes); president of the ekspertnaya komissiya VAK po avtomatizatsii i priborostroyeniya (Committee of Specialists of the VAK for Automatization and Construction of Equipment) Chief editor of the "Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki (Journal of computing mathematics and mathematical physics). A. A. Dorodnitsyn participated in the following congresses: Sweden in 1957; USA in 1958; France in 1959; Poland in 1959; Spain in 1958;

Card 2/3

S/042/61/016/002/005/005
C 111/ C 222

Anatoliy Alekseyevich Dorodnitsyn ...

Switzerland in 1960. His papers contain essential contributions in the domains: dynamic meteorology, gas dynamics and applied mathematics.

The authors mention N. Ye. Zhukovskiy and S. A. Chaplygin. There is a list containing the publications of A. A. Dorodnitsyn (1936-1960) with 23 titles and a photo of him.

Card 3/3

S/208/62/002/005/001/009
B112/B102

16.1500

AUTHORS: Belotserkovskiy, O. M., Chushkin, P. I. (Moscow)

TITLE: Numerical method of integral relations

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 2, no. 5, 1962, 731-759

TEXT: Investigations carried out at the Vychislitel'nyy tsentr Akademii nauk SSSR (Computer Center of the Academy of Sciences USSR) are reported. In N-th approximation, a system

$$\partial P_i(x,y,u_1,\ldots,u_k)/\partial x + \partial Q_i(x,y,u_1,\ldots,u_k)/\partial y = F_i(x,y,u_1,\ldots,u_k) \quad (1)$$

is reduced to a system of kN ordinary differential equations in the following way: For each index i, a system of N linearly independent functions $f_n(y)$ is chosen. The integrals

$$\int_0^{\Delta(x)} f_n(y)P\,dy$$

Card 1/2

Numerical method of integral relations

occurring in the integral relations of the form

$$d\left(\int_0^{\Delta(x)} f(y)Pdy\right)/dx - \Delta'(x)f(\Delta)P_\Delta + f(\Delta)Q_\Delta - f(0)Q_0 - \int_0^{\Delta(x)} f'(y)Qdy = \int_0^{\Delta(x)} f(y)Fdy \quad (3)$$

are represented by $\Delta(x)\sum_{n=0}^{N} C_n P_n(x)$, where $P_n(x) = P(x,y_n,u_{1n},\ldots,u_{kn})$, $u_{\nu n} = u_\nu(x,y_n)$, $y_n(x) = n\Delta(x)/N$. Hence the integral relations (3) form a system of kN ordinary differential equations in the variable x with the k(N+1) unknown functions $u_{\nu n}(x)$. The system completed by k boundary conditions may be solved by an arbitrary numerical method. Many gasdynamical problems have been solved by this method. Potential flows, shock waves, and flows of a viscous gas are considered as examples. There are 13 figures.

SUBMITTED: June 1, 1962

Card 2/2

BELOTSERKOVSKIY, O.M.; CHUSHKIN, P.I. (Moskva)

Supersonic flow past blunt bodies. Archiw mech 14 no.3/4:461-490 '62.

1. Vychislitel'nyy tsentr Akademii nauk SSSR.

24430

S/208/62/002/006/005/007
B112/B186

AUTHOR: Belotserkovskiy, O. M. (Moscow)

TITLE: Symmetrical supersonic flow of ideal and real gases around blunt bodies

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 2, no. 6, 1963, 1062-1085

/B

TEXT: This article is a review on gasdynamical computations according to the method of integral relations, carried out at the Vychislitel'nyy tsentr AN SSSR(Computer Center of the AS USSR). The following three cases are considered: 1. Ideal gases. 2. Equilibrium flow. 3. Non-equilibrium flow. The equations of motion have the following structure:

$$\frac{\partial Z}{\partial s} + \frac{\partial (AH)}{\partial n} = Y, \quad (1)$$

$$\frac{\partial G}{\partial s} + \frac{\partial (AZ)}{\partial n} = X, \quad (2)$$

$$\frac{\partial \Lambda}{\partial s} + \frac{\partial (AL)}{\partial n} = 0. \quad (3)$$

Card 1/2

Symmetrical supersonic flow of ideal ...

In addition certain boundary conditions are characteristic of the shock wave. These equations are solved in the following way: The domain of integration is divided into a certain number of strips as shown in Fig. 3. In each strip, the integrals of the given equations are substituted by corresponding interpolation polynomials, whereby an approximation system of ordinary differential equations is obtained. An example is solved explicitly. There are 12 figures and 1 table.

SUBMITTED: June 7, 1962

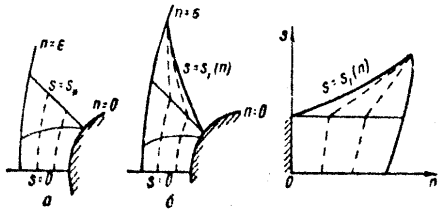

Fig. 3

Card 2/2

BELOTSERKOVSKY, O. M.; GOLOMAZOV, M. M.; DUSHIN, V. K.; IVANOV, V. R. (Moscow)

"Supersonic gas flow around blunt bodies"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 1964.

ACCESSION NR: AP4012004 S/0208/64/004/001/0061/0077

AUTHORS: Belotserkovskiy, O. M. (Moscow); Dushin, V. K. (Moscow)

TITLE: Nonequilibrium supersonic flow over blunt bodies

SOURCE: Zhurnal vy*chisl. matem. i matem. fis., v. 4, no. 1, 1964, 61-77

TOPIC TAGS: nonequilibrium, supersonic flow, blunt body, axially symmetric, shock wave, oxygen concentration

ABSTRACT: The method of functional approximation along the shock wave has been used to study the flow characteristics of nonequilibrium supersonic flow over a blunt body. The gas is assumed to have μ-components containing λ-different types of atoms, flowing along an axially symmetric body at zero angle of attack with constant velocity W_∞. Viscosity, diffusion, and thermal conductivity are neglected. A body-centered orthogonal system has been used (see Enclosure) with one streamline and two family characteristics given by

$$\frac{dS_{s.v.}}{d\xi} = \frac{\omega}{A\omega - b_2 v},$$

$$\frac{dS_1}{d\xi} = \frac{\omega}{A\omega(\beta \pm \alpha) - b_2 v},$$

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where $\beta = \operatorname{arctg}(u/v)$, $\alpha = \arcsin(a_\infty/W)$.

The integration domain for the inviscid flow equation is given by

$$0 < \xi < 1, \quad 0 < S < S_1(\xi).$$

The approximation method used by O. M. Belotserkovskiy and P. I. Chushkin (Chislennyy metod integral'nykh sootnosheniy. Zh. vychisl. matem. i matem. fiz., 1962, 2, No. 5, 731-759) is applied to reduce the partial differential equations into six ordinary differential equations suitable for numerical computation. Calculations are extended to approximations of second order (N = 2), and the structure of the shock wave for $M_\infty = 10$, $p_\infty = 0.001$ and 0.01 atm, $T = 288K$ is determined. Temperature and oxygen concentration curves in the shock layer along the stagnation streamline are also given, using the dissociative relaxation equation in the form

$$\frac{dc_{O_2}}{dt} = -\frac{\rho}{m_{O_2}}\left[\beta C_O C_{O_2} K_D(O_2, O) + C_{O_2} K_D(O_2, O_2)\right]\left[1 - \frac{c_{O_2}}{c_{O_2}^{eq}} \beta_p\right].$$

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The solution is found to be stable. "The authors are grateful to Yu. P. Lun'kin for his help in the nonequilibrium flow calculations." Orig. art. has: 25 equations, 10 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 26Aug63	DATE ACQ: 14Feb64	ENCL: 01
SUB CODE: AS	NO REF SOV: 008	OTHER: 001

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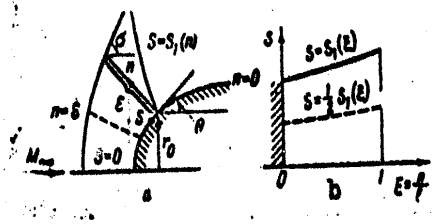
ACCESSION NR: AP4012004

ENCLOSURE: 01



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ACCESSION NR: AP4024563 S/0208/64/004/002/0306/0316

AUTHORS: Belotserkovskiy, O. M. (Moscow); Golomazov, M. M. (Moscow); Shulishnina, N. P. (Moscow)

TITLE: Solution of equilibrium dissociating gas flow over blunt body with detached shock

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 2, 1964, 306-316

TOPIC TAGS: equilibrium gas, blast body, thermodynamic equilibrium, shock wave, equation of state, equilibrium constant

ABSTRACT: The symmetric flow of an ideal dissociated equilibrium gas over a blunt body has been investigated. Thermodynamic equilibrium is assumed to hold for characteristic flow times much larger than gas relaxation times. The direct method is used with approximations taken normal to the shock wave. The continuity and stream function equations are written in curvilinear body-fixed coordinates to which are added the equation of state and the energy equation for a non-heat conducting gas. A system of 2N independent integral relationships is obtained by dividing the space between the body and the shock wave into N-1 intermediate lines,

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thus $$n = n_i(s) = \frac{N+i+1}{N}\varepsilon(s), \quad i = 2, 3 \ldots N_1$$

and integrating the continuity equations along lines s = constant. The resulting equations are shown to be applicable to any arbitrary body contour. The equilibrium constants are approximated by

$$\ln K p_i = A \ln T + \frac{B}{T} + C,$$

and the solution is given up to a second order approximation on a digital computer BESM-2, using standard programming techniques of flow around blunt bodies. Numerical results for a sphere and ellipse are given at Mach 6, $\gamma = 1.4$, and T = 300K, and for various free stream static pressures. Orig. art. has: 50 equations and 12 figures.

ASSOCIATION: none

SUBMITTED: 15Aug63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: AS NO REF SOV: 006 OTHER: 000

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L 01241-67 EWT(1)/EWP(m) WW

ACC NR: AP6032938 SOURCE CODE: UR/0208/66/006/005/0930/0934

AUTHOR: Belotserkovskiy, O. M. (Moscow); Sedova, Ye. S. (Moscow); Shugayev, F. V. (Moscow)

ORG: none

TITLE: Supersonic flow past blunted bodies of revolution with contour discontinuity

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 6, no. 5, 1966, 930-934

TOPIC TAGS: supersonic aerodynamics, supersonic flow, shock wave, integral method, flow field, flow analysis

ABSTRACT: This paper deals with application of the direct method to the problem of supersonic flow past blunted bodies with a contour discontinuity which determines the location of the sonic point. A solution is sought by considering the scheme II of the method of integral relations [Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 1, 1964] and using the Vaglio-Laurin asymptotic solution perfected and reduced to a form convenient for computers. Supersonic flow of a perfect gas past an axisymmetric body of revolution at an angle of attack is investigated and the case is considered when the flow velocity at the corner point attains the velocity of sound, and when the shape of the body behind the corner point has no effect on subsonic flow near the nose. A solution is obtained for the flow field bounded by

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